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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/691,539	10/24/2003	Tadashi Oba	32739M089	6873
441	7590	01/11/2005	EXAMINER	
SMITH, GAMBRELL & RUSSELL, LLP 1850 M STREET, N.W., SUITE 800 WASHINGTON, DC 20036			PHAM, HAI CHI	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

**Office Action Summary**

Application No.

10/691,539

Applicant(s)

OBA ET AL.

Examiner

Hai C Pham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 11-20 and 22 is/are allowed.
- 6) ☒ Claim(s) 1, 6-10 and 21 is/are rejected.
- 7) ☒ Claim(s) 2-5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>10/24/03</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Priority*

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 6-7, 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kimoto et al. (JP 2002-067372) in view of Rushing (U.S. 5,933,682).

Kimoto et al., an acknowledged prior art, discloses a LED print head used in an image forming apparatus, the LED print head comprising a plurality of light-emitting elements for exposing a photoconductor drum to form an image, wherein the driving current is corrected based on a stored corrected value such that the dot diameter fluctuation is compensated, the adjusted driving current also taking into account a magnitude of a parameter that affects a granularity of the image, e.g., sensitivity of the photosensitive drum (Abstract).

However, Kimoto et al. fails to disclose the correction coefficient for compensating for variations of the light quantity emitted from the light-emitting elements,

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and the granularity of the image being related to the screen angle peculiar to an image pixel.

Rushing discloses a LED printer having a plurality of light-emitting element arrays or chips, wherein the driver current for each light-emitting element is adjusted for compensating for the differences in the emission characteristics of the LEDs on the print head due to differences in processing of the LEDs, and wherein an exposure time is set in accordance with the image gray level signal. Rushing further teaches that the adjustment of the driving current can be obtained for different image density in accordance with a tilt direction being provided (col. 5, line 62 to col. 6, line 61).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to provide the correction coefficient for compensating for variations of the light quantity emitted from the light-emitting elements in the device of Kimoto et al. as taught by Rushing. The motivation for doing so would have been to compensate for the differences in the emission characteristics of each of the LEDs such that the exposure of the photosensitive drum becomes uniform.

The method claim 21 is deemed to be clearly anticipated by functions of the above structures.

4. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimoto et al. in view of Rushing, as applied to claim 1 above, and further in view of Manzer et al. (U.S. 5,124,732).

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Kimoto et al., as modified by Rushing, discloses all the basic limitations of the claimed invention except for the granularity of the image being a surface temperature of the photoconductor.

Manzer et al. discloses an electrophotographic printer in which the drive current of the LEDs of the print head is adjusted in accordance with the temperature of the photoconductor (col. 9, lines 22-40).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to adjust the driving current of the light-emitting element in the print head of Kimoto et al. in accordance with the temperature of the photoconductor as taught by Manzer et al. The motivation for doing so would have been to produce a uniform image density.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kimoto et al. in view of Rushing, as applied to claim 1 above, and further in view of Yamada et al. (U.S. 5,463,473).

Kimoto et al., as modified by Rushing, discloses all the basic limitations of the claimed invention except for the granularity of the image being a developing bias voltage applied to a developing apparatus.

However, it is well known in the art that each printer has different development characteristics as evidenced by Yamada et al. (col. 1, lines 46-51), which discloses an image recording apparatus in which the drive current of the laser unit (5) is adjusted in accordance with the controlled developing bias power source (6) being applied to the

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developing unit (7) for compensating for the difference in the developing bias of the developing unit.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to correct the driving current of the light-emitting element in the print head of Kimoto et al. in accordance with the controlled developing bias applied to the developing unit as taught by Yamada et al. The motivation for doing so would have been to compensate for the variation of the development characteristic of the printer as suggested by Yamada et al.

***Allowable Subject Matter***

6. Claims 11-20 and 22 are allowed.

7. Claims 2-5 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. The following is an examiner's statement of reasons for allowance: claims 11 and 22 are patentable over the prior art patents and printed publications because of the specific adjustment mechanism for first adjusting the driving current of the light-emitting elements in a LED printer when the image pixel has a low gray level, then adjusting the driving current of the light-emitting elements when the image pixel has a low gray level and finally driving the light-emitting elements by using a linear interpolation from the driving current in the low gray level to the driving current in the high gray level. The combined limitations are not taught by the prior art of record alone or in combination.

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The primary reason for the indication of the allowability of claim 2 is the inclusion therein, in combination as currently claimed, of the limitation "wherein the beam spot area correction coefficient is a value that corresponds to a magnitude of a difference between an average value obtained by averaging out beam spot areas of the plurality of light-emitting elements", which is not found taught by the prior art of record considered alone or in combination.

Claims 3-5 and 12-20 are allowable because they are dependent from claims 2 and 11 above.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (571) 272-2260. The examiner can normally be reached on M-F 8:30AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David L Talbott can be reached on (571) 272-1934. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



HAI PHAM  
PRIMARY EXAMINER

January 8, 2005